CLAIMS

What is claimed is:

1. A method for testing a laser, comprising:

operating the laser at a first bias setting, the laser having a data rate at the first bias setting of about 10 Gb/s;

measuring a first side mode suppression ratio of the laser output based on a first ratio of highest and next highest optical power peaks as a function of a first wavelength while operating the laser at the first bias setting and at a data rate of about 10 Gb/s;

operating the laser at a second bias setting, the laser having a data rate at the second bias setting of about 10 Gb/s;

measuring a second side mode suppression ratio of the laser output based on a second ratio of highest and next highest optical power peaks as a function of a second wavelength while operating the laser at the second bias setting and at a data rate of about 10 Gb/s; and

generating a test result for the laser in accordance with a difference between the first and second side mode suppression ratios.

2. The method as recited in claim 1, wherein at least one of the first and second bias settings causes the laser to operate substantially within a range of current levels that is at least partially below a threshold current level of the laser.

3. The method as recited in claim 1, wherein each side mode suppression ratio is computed using the following formula:

Side Mode Suppression Ratio = $10\text{Log}_{10}(\text{Peak1}/\text{Peak2})$,

where,

Peak1 = a value of a highest optical power peak, and

Peak2 = a value of a second highest optical power peak.

4. The method as recited in claim 1, wherein one of the first and second bias settings comprises a lower DC current level voltage than the other of the first and second bias settings.

5. The method as recited in claim 1, wherein levels of AC and DC current supplied to the laser at the first bias setting are determined by:

adjusting the DC current supplied to the laser until a desired optical output is achieved; and

adjusting the AC current supplied to the laser until a desired extinction ratio is achieved.

6. The method as recited in claim 5, wherein the AC current is adjusted subsequent to adjustment of the DC current.

7. The method as recited in claim 1, wherein levels of AC and DC current supplied to the laser at the second bias setting are determined by:

adjusting a DC current supplied to the laser until the DC current achieves a predetermined relationship relative to the DC current that was supplied to the laser at the first bias setting; and

substantially maintaining an AC current supplied to the laser at the first bias setting.

8. The method as recited in claim 1, further comprising using the test result in evaluating suitability of the laser for a particular application.

9. A method for testing a laser, comprising:

operating the laser at a first bias setting;

measuring a first side mode suppression ratio of the laser output based on a first ratio of highest and next highest optical power peaks as a function of a first wavelength while operating the laser at the first bias setting;

operating the laser at a second bias setting;

measuring a second side mode suppression ratio of the laser output based on a second ratio of highest and next highest optical power peaks as a function of a second wavelength while operating the laser at the second bias setting;

correlating a difference between the first and second side mode suppression ratios with a measured bit error rate; and

determining a value of an operational parameter for the laser based upon the correlation between the suppression ratio difference and measured bit error rate.

10. The method as recited in claim 9, wherein the operational parameter comprises at least one of: a data rate associated with the laser; and, a transmission length associated with the laser.

11. The method as recited in claim 9, wherein the measured bit error rate is a bit error rate associated with the laser.

12. The method as recited in claim 9, wherein the laser is operated at a data rate of about 10Gb/s during at least a portion of the test.

13. The method as recited in claim 9, wherein at least one of the first and second bias settings causes the laser to operate substantially within a range of current levels that is at least partially below a threshold current level of the laser.

14. The method as recited in claim 9, wherein one of the first and second bias settings comprises a lower DC current level voltage than the other of the first and second bias settings.

15. The method as recited in claim 9, wherein levels of AC and DC current supplied to the laser at the first bias setting are determined by:

adjusting the DC current supplied to the laser until a desired optical output is achieved; and

adjusting the AC current supplied to the laser until a desired extinction ratio is achieved.

16. The method as recited in claim 9, wherein levels of AC and DC current supplied to the laser at the second bias setting are determined by:

adjusting a DC current supplied to the laser until the DC current achieves a predetermined relationship relative to the DC current that was supplied to the laser at the first bias setting; and

substantially maintaining an AC current supplied to the laser at the first bias setting.

17. The method as recited in claim 16, wherein the predetermined relationship comprises one of: the DC current supplied to the laser at the second bias setting is greater than the DC current supplied to the laser at the first bias setting; and, the DC current supplied to the laser at the second bias setting is less than the DC current supplied to the laser at the first bias setting.

18. A computer program product for implementing a method for testing a laser, the computer program product comprising:

a computer readable medium carrying computer executable instructions for performing the method, wherein the method comprises:

causing operation of the laser at a first bias setting, the laser having a data rate at the first bias setting of about 10 Gb/s;

measuring a first side mode suppression ratio of a laser output based on a first ratio of highest and next highest optical power peaks as a function of a first wavelength while operating the laser at the first bias setting and at a data rate of about 10 Gb/s;

causing operation of the laser at a second bias setting, the laser having a data rate at the second bias setting of about 10 Gb/s;

measuring a second side mode suppression ratio of a laser output based on a second ratio of highest and next highest optical power peaks as a function of a second wavelength while operating the laser at the second bias setting and at a data rate of about 10 Gb/s; and

generating a test result for the laser in accordance with a difference between the first and second side mode suppression ratios.

19. The computer program product as recited in claim 18, wherein causing operation of the laser at a first bias setting comprises transmitting at least one control signal that causes operation of the laser at the first bias setting.

20. The computer program product as recited in claim 18, wherein causing operation of the laser at a second bias setting comprises transmitting at least one control signal that causes operation of the laser at the second bias setting.

21. The computer program product as recited in claim 18, wherein at least one of the first and second bias settings causes the laser to operate substantially within a range of current levels that is at least partially below a threshold current level of the laser.

22. The computer program product as recited in claim 18, wherein one of the first and second bias settings comprises a lower DC current level voltage than the other of the first and second bias settings.

23. The computer program product as recited in claim 18, wherein levels of AC and DC current supplied to the laser at the first bias setting are determined by:

adjusting the DC current supplied to the laser until a desired optical output is achieved; and

adjusting the AC current supplied to the laser until a desired extinction ratio is achieved.

24. The computer program product as recited in claim 18, wherein each side mode suppression ratio is computed using the following formula:

Side Mode Suppression Ratio = $10\text{Log}_{10}(\text{Peak1}/\text{Peak2})$,

where,

Peak1 = a value of a highest optical power peak, and

Peak2 = a value of a second highest optical power peak.

25. The computer program product as recited in claim 18, wherein levels of AC and DC current supplied to the laser at the second bias setting are determined by:

adjusting a DC current supplied to the laser until the DC current achieves a predetermined relationship relative to the DC current that was supplied to the laser at the first bias setting; and

substantially maintaining an AC current supplied to the laser at the first bias setting.

26. The computer program product as recited in claim 18, further comprising using the test result as a basis for identifying an optimal data rate for the laser.

27. The computer program product as recited in claim 26, wherein the optimal data rate corresponds to a permissible bit error rate.

28. A computer program product for implementing a method for testing a laser, the computer program product comprising:

a computer readable medium carrying computer executable instructions for performing the method, wherein the method comprises:

causing operation of the laser at a first bias setting;

measuring a first side mode suppression ratio of a laser output based on a first ratio of highest and next highest optical power peaks as a function of a first wavelength while operating the laser at the first bias setting;

causing operation of the laser at a second bias setting;

measuring a second side mode suppression ratio of a laser output based on a second ratio of highest and next highest optical power peaks as a function of a second wavelength while operating the laser at the second bias setting;

correlating a difference between the first and second side mode suppression ratios with a measured bit error rate; and

determining a value of an operational parameter for the laser based upon the correlation between the suppression ratio difference and measured bit error rate.

29. The computer program product as recited in claim 28, wherein the operational parameter comprises at least one of: a data rate associated with the laser; and, a transmission length associated with the laser.

30. The computer program product as recited in claim 28, wherein causing operation of the laser at a first bias setting comprises transmitting at least one control signal that causes operation of the laser at the first bias setting.

31. The computer program product as recited in claim 28, wherein causing operation of the laser at a second bias setting comprises transmitting at least one control signal that causes operation of the laser at the second bias setting.

32. The computer program product as recited in claim 28, wherein the measured bit error rate is a bit error rate associated with the laser.

33. The computer program product as recited in claim 28, wherein the laser is operated at a data rate of about 10Gb/s during at least a portion of the test.

34. The computer program product as recited in claim 28, wherein at least one of the first and second bias settings causes the laser to operate substantially within a range of current levels that is at least partially below a threshold current level of the laser.

35. The computer program product as recited in claim 28, wherein one of the first and second bias settings comprises a lower DC current level voltage than the other of the first and second bias settings.

36. The computer program product as recited in claim 28, wherein levels of AC and DC current supplied to the laser at the first bias setting are determined by:

adjusting the DC current supplied to the laser until a desired optical output is achieved; and

adjusting the AC current supplied to the laser until a desired extinction ratio is achieved.

37. The computer program product as recited in claim 28, wherein levels of AC and DC current supplied to the laser at the second bias setting are determined by:

adjusting a DC current supplied to the laser until the DC current achieves a predetermined relationship relative to the DC current that was supplied to the laser at the first bias setting; and

substantially maintaining an AC current supplied to the laser at the first bias setting.

38. A system for testing a laser, comprising:

a data source configured to transmit a data stream signal;

an evaluation board configured to receive the data stream signal from the data source and to transmit the received data stream signal to the laser;

a test device configured to measure optical output of the laser with respect to wavelength; and

a computer coupled to the evaluation board and the test device, the computer including control software comprising one or more modules for testing the laser by:

causing the evaluation board to operate the laser at a first bias setting;

receiving, from the test device, information associated with operation of the laser at the first bias setting, and using the received information to determine a first side mode suppression ratio of the laser output based on a first ratio of highest to next highest optical power peaks as a function of a first wavelength;

causing the evaluation board to operate the laser at a second bias setting;

receiving, from the test device, information associated with operation of the laser at the second bias setting, and using the received information associated with the second bias setting to determine a second side mode suppression ratio of the laser output based on a second ratio of

highest to next highest optical power peaks as a function of a second wavelength; and

generating a test result for the laser in accordance with a difference between the first and second side mode suppression ratios.

39. The system as recited in claim 38, wherein a data stream signal transmitted to the laser has an associated data rate of about 10 Gb/s.

40. The system as recited in claim 38, wherein causing operation of the laser at a first bias setting comprises transmitting at least one control signal that causes operation of the laser at the first bias setting.

41. The system as recited in claim 38, wherein causing operation of the laser at a second bias setting comprises transmitting at least one control signal that causes operation of the laser at the second bias setting.

42. The system as recited in claim 38, wherein the test device is configured to communicate with the laser by way of an optical fiber.

43. The system as recited in claim 38, wherein the laser is configured to, at least indirectly, physically and electrically interface with the evaluation board.

44. The system as recited in claim 38, wherein the test device comprises an optical spectrum analyzer.

45. The system as recited in claim 38, wherein the control software of the computer comprises:

an evaluation board control module;

an optical spectrum analyzer control module; and

a test data evaluation module.